Complete Summary

GUIDELINE TITLE

Appropriate imaging work-up of breast microcalcifications.

BIBLIOGRAPHIC SOURCE(S)

D'Orsi C, Bassett LW, Berg WA, Bohm-Velez M, Evans WP III, Farria DM, Lee C, Mendelson E, Goldstein S, Expert Panel on Women's Imaging. Appropriate imaging work-up of breast microcalcifications. [online publication]. Reston (VA): American College of Radiology (ACR); 2005. 12 p. [17 references]

GUIDELINE STATUS

This is the current release of the guideline.

It updates a previously published version: Cardenosa G, Mendelson E, Bassett L, Bohm-Velez M, D'Orsi C, Evans WP 3rd, Monsees B, Thurmond A, Goldstein S. Appropriate imaging work-up of breast microcalcifications. American College of Radiology. ACR Appropriateness Criteria. Radiology. 2000 Jun;215 Suppl:973-80.

The appropriateness criteria are reviewed annually and updated by the panels as needed, depending on introduction of new and highly significant scientific evidence.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Breast microcalcifications

GUIDELINE CATEGORY

Diagnosis
Evaluation

CLINICAL SPECIALTY

Family Practice
Internal Medicine
Nuclear Medicine
Obstetrics and Gynecology
Oncology
Radiology

INTENDED USERS

Health Plans
Hospitals
Managed Care Organizations
Physicians
Utilization Management

GUIDELINE OBJECTIVE(S)

To evaluate the appropriateness of radiologic procedures for patients with breast microcalcifications

TARGET POPULATION

Women with breast microcalcifications

INTERVENTIONS AND PRACTICES CONSIDERED

1. X-ray (mammography)
    - Magnification views & magnification views with 2 projections
    - Orthogonal views (90^{o} lateral and cranial-caudal [CC] views if not readily available)
    - Tangential views, dermal localization exam
2. Invasive procedures
    - Core biopsy
    - Excisional biopsy
    - Fine needle aspiration (FNA)
3. Ultrasound (US)
4. Magnetic resonance imaging (MRI)
5. Physical examination
6. Six month follow-up
7. Nuclear medicine (NUC), sestamibi

MAJOR OUTCOMES CONSIDERED

Utility of radiologic examinations in differential diagnosis

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developer performed literature searches of peer-reviewed medical journals, and the major applicable articles were identified and collected.

NUMBER OF SOURCE DOCUMENTS

The total number of source documents identified as the result of the literature search is not known.

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Not Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not stated

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

One or two topic leaders within a panel assume the responsibility of developing an evidence table for each clinical condition, based on analysis of the current literature. These tables serve as a basis for developing a narrative specific to each clinical condition.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus (Delphi)

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Since data available from existing scientific studies are usually insufficient for meta-analysis, broad-based consensus techniques are needed for reaching agreement in the formulation of the appropriateness criteria. The American College of Radiology (ACR) Appropriateness Criteria panels use a modified Delphi technique to arrive at consensus. Serial surveys are conducted by distributing questionnaires to consolidate expert opinions within each panel. These questionnaires are distributed to the participants along with the evidence table

and narrative as developed by the topic leader(s). Questionnaires are completed by the participants in their own professional setting without influence of the other members. Voting is conducted using a scoring system from 1 to 9, indicating the least to the most appropriate imaging examination or therapeutic procedure. The survey results are collected, tabulated in anonymous fashion, and redistributed after each round. A maximum of three rounds is conducted and opinions are unified to the highest degree possible. Eighty percent agreement is considered a consensus. This modified Delphi technique enables individual, unbiased expression, is economical, easy to understand, and relatively simple to conduct.

If consensus cannot be reached by this Delphi technique, the panel is convened and group consensus techniques are utilized. The strengths and weaknesses of each test or procedure are discussed and consensus reached whenever possible. If "No consensus" appears in the rating column, reasons for this decision are added to the comment sections.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

ACR Appropriateness Criteria®

Clinical Condition: Calcifications

Variant 1: Pleomorphic, fine, linear, branching in any distribution.

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, breast, mammography,	9	CC and 90° lateral views preferred.

Radiologic Exam Procedure	Appropriateness Rating	Comments
magnification views		
INV, breast, biopsy, core	9	
X-ray, breast, mammography, orthogonal views (90^{o} lateral and CC views if not readily available)	7	Orthogonal views may be useful in positioning for the spot compression magnification views to be sure to include the calcifications. They will also be useful for pre-stereotactic localization or localization procedure.
INV, breast, biopsy, excisional	6	If discordant needle biopsy results or concerned about sampling error. If image guided percutaneous biopsy not available.
US, breast	4	May be useful in dense breast to look for mass component in lesion.
MRI, breast	3	Specific indications are still being investigated.
Physical examination	2	Physical examination does not play a role in the evaluation of calcifications.
6-month follow-up	2	
INV, breast, fine needle aspiration (FNA)	2	
NUC, breast, sestamibi	1	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 2: Documentation of skin calcification.

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, breast, mammography, tangential views, dermal localization	8	Only if calcifications are not typically dermal in appearance.

Radiologic Exam Procedure	Appropriateness Rating	Comments
exam		
Physical examination	2	Physical examination does not play a role in the evaluation of calcifications.
X-ray, breast, mammography, magnification views	1	
US, breast	1	
6-month follow-up	1	
INV, breast, fine needle aspiration (FNA)	1	
INV, breast, biopsy, core	1	
INV, breast, fine needle aspiration (FNA)	1	
MRI, breast	1	
NUC, breast, sestamibi	1	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 3: Milk of calcium, any distribution.

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, breast, mammography, magnification views	8	CC and 90^{o} lateral views preferred.
X-ray, breast, mammography, orthogonal views (90^{o} lateral and CC views if not readily available)	7	Orthogonal views may be useful in positioning for the spot compression magnification views to be sure to include the calcifications.

Radiologic Exam Procedure	Appropriateness Rating	Comments
US, breast	2	
6-month follow-up	2	
INV, breast, fine needle aspiration (FNA)	2	
INV, breast, biopsy, core	2	
INV, breast, biopsy, excisional	2	
Physical examination	1	Physical examination does not play a role in the evaluation of calcifications.
MRI, breast	1	
NUC, breast, sestamibi	1	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 4: Amorphous, single cluster.

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, breast, mammography, magnification views	9	CC and 90° lateral views preferred.
INV, breast, biopsy, core	8	
X-ray, breast, mammography, orthogonal views (90^{o} lateral and CC views if not readily available)	7	Orthogonal views may be useful in positioning for the spot compression magnification views to be sure to include the calcifications. They will also be useful for pre-stereotactic localization or localization procedure.
INV, breast, biopsy, excisional	6	If discordant needle biopsy results or concerned about sampling error. If image guided percutaneous biopsy not

Radiologic Exam Procedure	Appropriateness Rating	Comments
		available.
6-month follow-up	3	If present in retrospect and stable, 6-month follow-up can be considered.
US, breast	2	
Physical examination	3	Physical examination does not play a role in the evaluation of calcifications.
INV, breast, fine needle aspiration (FNA)	2	
MRI, breast	2	Specific indications are still being investigated.
NUC, breast, sestamibi	1	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 5: Amorphous, multiple cluster, one breast.

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, breast, mammography, magnification views	9	CC and 90° lateral views preferred.
X-ray, breast, mammography, orthogonal views (90° lateral and CC views if not readily available)	7	Orthogonal views may be useful in positioning for the spot compression magnification views to be sure to include the calcifications. They will also be useful for pre-stereotactic localization or localization procedure.
INV, breast, biopsy, core	7	Sampling of representative grouping is recommended with further management dependent on histology.
6-month follow-up	No Consensus	Some would only follow-up after work-up complete and biopsy of dominant cluster benign. Others would be more conservative. If no dominant cluster,

Radiologic Exam Procedure	Appropriateness Rating	Comments
		they would do 6-month follow-up.
INV, breast, biopsy, excisional	3	
US, breast	2	
Physical examination	2	Physical examination does not play a role in the evaluation of calcifications.
INV, breast, fine needle aspiration (FNA)	2	
MRI, breast	2	Specific indications are still being investigated.
NUC, breast, sestamibi	1	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 6: Amorphous, multiple bilateral clusters.

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, breast, mammography, magnification views	8	CC and 90° lateral views preferred.
X-ray, breast, mammography, orthogonal views (90° lateral and CC views if not readily available)	7	Orthogonal views may be useful in positioning for the spot compression magnification views to be sure to include the calcifications.
6-month follow-up	7	Once work-up demonstrates uniform, probably benign appearance of all calcifications.
US, breast	2	
Physical examination	2	Physical examination does not play a role in the evaluation of calcifications.

Radiologic Exam Procedure	Appropriateness Rating	Comments
INV, breast, fine needle aspiration (FNA)	2	
INV, breast, biopsy, core	2	
INV, breast, biopsy, excisional	2	
MRI, breast	2	Specific indications are still being investigated.
NUC, breast, sestamibi	1	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 7: Amorphous in a regional distribution.

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, breast, mammography, magnification views	8	CC and 90° lateral views preferred.
X-ray, breast, mammography, orthogonal views (90° lateral and CC views if not readily available)	7	Orthogonal views may be useful in positioning for the spot compression magnification views to be sure to include the calcifications. They will also be useful for pre-stereotactic localization or localization procedure.
INV, breast, biopsy, core	6	
US, breast	2	
Physical examination	2	Physical examination does not play a role in the evaluation of calcifications.
6-month follow-up	2	
INV, breast, fine needle aspiration	2	

Radiologic Exam Procedure	Appropriateness Rating	Comments
(FNA)		
INV, breast, biopsy, excisional	2	
MRI, breast	2	Specific indications are still being investigated.
NUC, breast, sestamibi	1	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 8: Amorphous in a linear or segmental distribution.

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, breast, mammography, magnification views	9	CC and 90° lateral views preferred.
INV, breast, biopsy, core	8	
X-ray, breast, mammography, orthogonal views (90° lateral and CC views if not readily available)	7	Orthogonal views may be useful in positioning for the spot compression magnification views to be sure to include the calcifications. They will also be useful for pre-stereotactic localization or localization procedure.
INV, breast, biopsy, excisional	6	If discordant needle biopsy results or concerned about sampling error. If image guided percutaneous biopsy not available.
US, breast	4	May be useful in dense breast to look for mass component in lesion.
Physical examination	2	Physical examination does not play a role in the evaluation of calcifications.
6-month follow-up	2	
INV, breast, fine	2	

Radiologic Exam Procedure	Appropriateness Rating	Comments
needle aspiration (FNA)		
MRI, breast	2	Specific indications are still being investigated.
NUC, breast, sestamibi	1	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 9: Course (popcorn), large rod-like, dystrophic, suture, lucent-centered, egg shell rim.

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, breast, mammography, magnification views	2	
X-ray, breast, mammography, orthogonal views	2	
US, breast	2	
Physical examination	2	Physical examination does not play a role in the evaluation of calcifications.
6-month follow-up	2	
INV, breast, fine needle aspiration (FNA)	2	
INV, breast, biopsy, core	2	
INV, breast, biopsy, excisional	2	
MRI, breast	2	Specific indications are still being investigated.
NUC, breast, sestamibi	1	

Radiologic Exam Procedure	Appropriateness Rating	Comments
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 10: Round or punctate, clustered.

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, breast, mammography, magnification views	8	CC and 90° lateral views preferred.
6-month follow-up	8	Biopsy if increasing
X-ray, breast, mammography, orthogonal views (90° lateral and CC views if not readily available)	7	Orthogonal views may be useful in positioning for the spot compression magnification views to be sure to include the calcifications.
INV, breast, biopsy, core	4	Only if increasing.
US, breast	2	
Physical examination	2	Physical examination does not play a role in the evaluation of calcifications.
INV, breast, fine needle aspiration (FNA)	2	
INV, breast, biopsy, excisional	3	
MRI, breast	2	Specific indications are still being investigated.
NUC, breast, sestamibi	1	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 11: Round or punctate, regional.

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, breast, mammography, magnification views	8	CC and 90° lateral views preferred.
X-ray, breast, mammography, orthogonal views (90° lateral and CC views if not readily available)	7	Orthogonal views may be useful in positioning for the spot compression magnification views to be sure to include the calcifications.
6-month follow-up	6	If magnification views show calcifications that are probably benign.
US, breast	2	
Physical examination	2	Physical examination does not play a role in the evaluation of calcifications.
INV, breast, fine needle aspiration (FNA)	2	
INV, breast, biopsy, core	2	
INV, breast, biopsy, excisional	2	
MRI, breast	2	Specific indications are still being investigated.
NUC, breast, sestamibi	1	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 12: Punctate calcifications in a linear or segmental distribution.

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, breast, mammography, magnification views	8	CC and 90° lateral views preferred.

Radiologic Exam Procedure	Appropriateness Rating	Comments
INV, breast, biopsy, core	8	
X-ray, breast, mammography, orthogonal views (90^{o} lateral and CC views if not readily available)	7	Orthogonal views may be useful in positioning for the spot compression magnification views to be sure to include the calcifications. They will also be useful for pre-stereotactic localization or localization procedure.
INV, breast, biopsy, excisional	6	If discordant needle biopsy results or concerned about sampling error. If image guided percutaneous biopsy not available.
US, breast	4	May be useful in dense breast to look for mass component in lesion.
Physical examination	2	Physical examination does not play a role in the evaluation of calcifications.
6-month follow-up	2	
INV, breast, fine needle aspiration (FNA)	2	
MRI, breast	2	Specific indications are still being investigated.
NUC, breast, sestamibi	1	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 13: Punctate and amorphous, diffuse, bilateral.

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, breast, mammography, magnification views	2	
X-ray, breast, mammography,	2	

Radiologic Exam Procedure	Appropriateness Rating	Comments
orthogonal views		
6-month follow-up	2	
US, breast	2	
Physical examination	2	Physical examination does not play a role in the evaluation of calcifications.
INV, breast, fine needle aspiration (FNA)	2	
Core biopsy	2	
INV, breast, biopsy, excisional	2	
MRI, breast	2	Specific indications are still being investigated.
NUC, breast, sestamibi	1	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 14: Course heterogeneous, single cluster.

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, breast, mammography, magnification views (2 projections)	8	CC and 90° lateral views preferred.
X-ray, breast, mammography, orthogonal views (90^{o} lateral and CC views if not readily available)	7	Orthogonal views may be useful in positioning for the spot compression magnification views to be sure to include the calcifications. They will also be useful for pre-stereotactic localization or localization procedure.
INV, breast, biopsy, core	6	If new or increasing.

Radiologic Exam Procedure	Appropriateness Rating	Comments
6-month follow-up	5	If magnification views demonstrate the calcifications to be probably benign.
INV, breast, biopsy, excisional	4	If suspicious and core not available.
US, breast	2	
Physical examination	2	Physical examination does not play a role in the evaluation of calcifications.
INV, breast, fine needle aspiration (FNA)	2	
MRI, breast	2	Specific indications are still being investigated.
NUC, breast, sestamibi	1	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 15: Course heterogeneous, multiple clusters, one breast.

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, breast, mammography, magnification views	8	CC and 90° lateral views preferred.
X-ray, breast, mammography, orthogonal views (90° lateral and CC views if not readily available)	7	Orthogonal views may be useful in positioning for the spot compression magnification views to be sure to include the calcifications.
6-month follow-up	7	If magnification views demonstrate the calcifications to be probably benign.
US, breast	2	
Physical examination	2	Physical examination does not play a role in the evaluation of calcifications.

Radiologic Exam Procedure	Appropriateness Rating	Comments
INV, breast, fine needle aspiration (FNA)	2	
INV, breast, biopsy, core	2	
INV, breast, biopsy, excisional	2	
MRI, breast	2	Specific indications are still being investigated.
NUC, breast, sestamibi	1	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 16: Course heterogeneous, multiple bilateral clusters.

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, breast, mammography, magnification views	2	
X-ray, breast, mammography, orthogonal views	2	
US, breast	2	
Physical examination	2	Physical examination does not play a role in the evaluation of calcifications.
6-month follow-up	2	
INV, breast, fine needle aspiration (FNA)	2	
INV, breast, biopsy, core	2	
INV, breast, biopsy,	2	

Radiologic Exam Procedure	Appropriateness Rating	Comments
excisional		
MRI, breast	2	Specific indications are still being investigated.
NUC, breast, sestamibi	1	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 17: Course heterogeneous, in regional distribution.

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, breast, mammography, magnification views	8	CC and 90° lateral views preferred.
X-ray, breast, mammography, orthogonal views (90° lateral and CC views if not readily available)	7	Orthogonal views may be useful in positioning for the spot compression magnification views to be sure to include the calcifications.
6-month follow-up	7	If magnification views demonstrate the calcifications to be probably benign.
INV, breast, biopsy, core	4	If new or increasing.
US, breast	3	If biopsy is contemplated and tissue is dense, may be useful to look for mass component in lesion.
Physical examination	2	Physical examination does not play a role in the evaluation of calcifications.
INV, breast, fine needle aspiration (FNA)	2	
INV, breast, biopsy, excisional	2	
MRI, breast	2	Specific indications are still being

Radiologic Exam Procedure	Appropriateness Rating	Comments
		investigated.
NUC, breast, sestamibi	1	
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Variant 18: Course heterogeneous, in linear or segmental distribution.

Radiologic Exam Procedure	Appropriateness Rating	Comments
X-ray, breast, mammography, magnification views	8	CC and 90° lateral views preferred.
INV, breast, biopsy, core	8	
X-ray, breast, mammography, orthogonal views (90° lateral and CC views if not readily available)	7	Orthogonal views may be useful in positioning for the spot compression magnification views to be sure to include the calcifications. They will also be useful for pre-stereotactic localization or localization procedure.
US, breast	4	May be useful in dense breast to look for mass component in lesion.
Physical examination	2	Physical examination does not play a role in the evaluation of calcifications.
6-month follow-up	2	
INV, breast, fine needle aspiration (FNA)	2	
INV, breast, biopsy, excisional	2	
MRI, breast	2	Specific indications are still being investigated.
NUC, breast, sestamibi	1	

Radiologic Exam Procedure	Appropriateness Rating	Comments
Appropriateness Criteria Scale 1 2 3 4 5 6 7 8 9 1 = Least appropriate 9 = Most appropriate		

Note: Abbreviations used in the tables are listed at the end of the "Major Recommendations" field.

Currently, ductal carcinoma-in-situ (DCIS) represents 25%-30% of all reported breast cancers. Approximately 95% of all DCIS is diagnosed because of mammographically detected microcalcifications. Prior to the widespread use of screening mammography, DCIS, detected as a mass on physical examination, was an uncommon disease representing less than 3% of all breast cancers. Screening mammography is the only reliable tool available for the detection of breast microcalcifications and DCIS.

Breast microcalcifications are detected commonly on screening mammograms. Most breast calcifications are benign and can be classified accordingly without any additional work-up. In women with indeterminate or malignant calcifications on screening studies, micro-focus (0.1 mm focal spot) magnification views in orthogonal projections are useful.

On magnification images, additional calcifications may be apparent, the morphology of individual calcifications can be characterized, and the distribution of calcifications can be better determined. In women with malignant calcifications, magnification images may be helpful in establishing the extent of disease.

Currently, the role for computer-aided detection (CAD) of calcifications has not yet been determined. However, recent studies indicate that computer-aided detection can be clinically useful to avoid false negatives when used properly.

Stereotactically guided core biopsy using a variety of devices can sample areas of microcalcifications. Stereotactically guided FNA of microcalcifications has been shown to be inaccurate. Core biopsy specimen radiographs should be done to establish the presence of calcifications in the core, as is done with surgically excised specimens.

Abbreviations

- CC, cranial-caudal
- FNA, fine needle aspiration
- INV, invasive
- MRI, magnetic resonance imaging
- NUC, nuclear medicine
- US, ultrasound

CLINICAL ALGORITHM(S)

Algorithms were not developed from criteria guidelines.

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The recommendations are based on analysis of the current literature and expert panel consensus.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Selection of appropriate radiologic imaging procedures for the evaluation of patients with breast microcalcifications

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

An American College of Radiology (ACR) Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those exams generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Personal Digital Assistant (PDA) Downloads

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Staying Healthy

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

D'Orsi C, Bassett LW, Berg WA, Bohm-Velez M, Evans WP III, Farria DM, Lee C, Mendelson E, Goldstein S, Expert Panel on Women's Imaging. Appropriate imaging work-up of breast microcalcifications. [online publication]. Reston (VA): American College of Radiology (ACR); 2005. 12 p. [17 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

1996 (revised 2005)

GUIDELINE DEVELOPER(S)

American College of Radiology - Medical Specialty Society

SOURCE(S) OF FUNDING

The American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria®.

GUIDELINE COMMITTEE

Committee on Appropriateness Criteria, Expert Panel on Women's Imaging--Breast Work Group

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Panel Members: Carl D'Orsi, MD; Lawrence W. Bassett, MD; Wendie A. Berg, MD, PhD; Marcela Bohm-Velez, MD; W. Phil Evans III, MD; Dione Marie Farria, MD, MPH; Carol Lee, MD; Ellen Mendelson, MD; Steven Goldstein, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

It updates a previously published version: Cardenosa G, Mendelson E, Bassett L, Bohm-Velez M, D'Orsi C, Evans WP 3rd, Monsees B, Thurmond A, Goldstein S. Appropriate imaging work-up of breast microcalcifications. American College of Radiology. ACR Appropriateness Criteria. Radiology. 2000 Jun;215 Suppl:973-80.

The appropriateness criteria are reviewed annually and updated by the panels as needed, depending on introduction of new and highly significant scientific evidence.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.

ACR Appropriateness Criteria® Anytime, Anywhere™ (PDA application). Available from the ACR Web site.

Print copies: Available from the American College of Radiology, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- ACR Appropriateness Criteria®. Background and development. Reston (VA): American College of Radiology; 2 p. Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on February 13, 2006.

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